University of Thessaly Department of Physical Education and Sport Sciences

Effectiveness of a Single-Subject Multiple-Baseline Design Self-Talk Intervention in Tennis Serve

By

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DECLARATION BY AUTHOR

This thesis contains no material that has been accepted for the award of any other degree in any educational institution. To the best of my knowledge and belief this thesis contains no material previously published or written by any other person, except where due reference is given in the text.

Signed ……. Date:.....

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ABSTRACT

Self-talk which refers to the talking to oneself and has been categorised into various forms has become very prominent in sports psychology. In this work, the effectiveness of self-talk of a single-subject multiple-baseline design self-talk intervention has been carried out. To achieve this, 5 Greek national players with minimum of 5 years playing experience within the same age range (11-18 years) were carefully selected. Intervention which tested the ability of these players to successfully aim at set targets with/without self-talk cues, were used to determine the effectiveness of self-talk in their serve ability. All players performed their tasks at different times and days usually in 2-sessions- morning and afternoon scheduled in such a way as not to affect their personal schedule. The entire exercise was done within 5-weeks.They were also encouraged to develop their own self-talk. The results showed that all the players in the intervention group (Players A, B, C and D) performed better (M=56, SD = 26.5; M = 72.5, SD=29.7; M=70.5, SD=26.8, and M=96.75, SD=44.87 respectively) than the player in the control group (Player E, M=54.75, SD= 26.2). Combination of motivational and instructional self-talk gave the best result among these players. While a direct relationship between the players' use of self-talk and their performance was equally observed. Finally, the results are discussed compared to the current self-talk literature and future research is recommended.

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Self-talk is a mental strategy that has become very prominent in sports psychology. It is used to define what athletes say to themselves during practice or competition. It is an internal dialogue in which the individuals interpret feelings and perceptions, regulate and change evaluations and cognitions and give themselves instructions and reinforcement (Zourbanos, 2013). Bunker, Williams, and Zinsser (1993) defined Self-talk as the talking to oneself which every individual does when thinking about something; while Theodorakis, Weinberg, Natsis, Douma, and Kazakas (2000) defined it as what people say to themselves either out loud or as a small voice inside their head. Those statements addressed to oneself which are multidimensional in nature having interpretative elements associated with the content of statements employed and somewhat dynamic serving at least two functions: instructional and motivational for the athlete can be said to be self-talk (Zourbanos, 2013). In other words, whatever definitions are given to self-talk, each lays emphasis are made on the content, functions, and possible outcomes of its application.

Two broad research analysis of self-talk has evolved so far namely: self-talk as content of thought, automatic or inherent self-talk - which refers to thoughts that individuals experience inherently and are not planned or prepared (Zourbanos, Hatzigeorgiadis, Chroni, Theodorakis, & Papaioannou, 2009); as well as the use of cue words that are planned or prepared, also referred to as mental strategy (Hardy, Roberts, Thomas, & Murphy, 2010). The latter approach has been shown to be helpful in improving performance and other cognitive and affective outcome measures in athletes (Theodorakis, Hatzigeorgiadis, & Zourbanos, 2012). Furthermore, self-talk could either be positive or negative. Positive self-talk is an asset that helps athletes stay focused and not dwell on past mistakes or project far in the future, while negative self-talk is self-demeaning, inappropriate, anxiety producing, and counterproductive. Zinsser, Bunker, and Williams (2001) identified that self-talk can be further categorized as instructional (e.g., Move your arm) or motivational (e.g., You can do

it). Instructional self-talk refers to statements related to attentional focus, technical information, and tactical choices, whereas motivational self-talk refers to statements related to confidence building, effort input, and positive moods. However, it has to be mentioned that talking negatively to oneself may not always be detrimental to performance, and in some situation depending on the nature of the sport and the competitive level of the athlete it may have motivating effects and facilitate performance (Zourbanos, Hatzigeorgiadis, Tsiakaras, Chroni, & Theodorakis, 2010).

According to Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis (2014), the effectiveness of self-talk strategies in sport has been receiving increasing research attention in recent years. These self-talk strategies are based on the use of cues that aim at facilitating learning and enhancing performance. Such strategies have been implemented in a variety of sports such as: evaluation of its effect on golf performance (Marshall, Hanrahan and Zourbanos, 2016), and on swimmers performance (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2014). This strategy has also been implemented for motor and sport tasks ranging from fine (Van Raalte, Brewer, Rivera, Petitpas, 1994), to gross (Hamilton, Scott, & MacDougall, 2007), with participants varying from school (Kolovelonis, Goudas, & Dermitzaki, 2011) and university students (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004), to beginner (Perkos, Theodorakis, & Chroni, 2002) and experienced athletes (Landin & Hebert, 1999). In addition, a variety of interventions have been implemented, ranging from cross-sectional (Malouff, McGee, Halford, & Rooke, 2008) to multi-week interventions (Perkos, Theodorakis, & Chroni, 2002), and several experimental designs have been applied, such as single subject multiple baseline designs (Johnson, Hrycaiko, Johnson, & Halas, 2004) etc. Overall, the results have provided support for the effectiveness of self-talk strategies for improving task performance.

The work of Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, (2011) highlighting the effectiveness of self-talk interventions in sport showed as follows: (a) that self-talk was more effective for tasks requiring fine skills, such as precision and accuracy, rather than tasks requiring gross skills, such as strength and endurance; (b) self-talk was more effective in novel rather than in well-learned tasks; (c)

interventions including training of self-talk were more effective than intervention where no training was implemented. It also shows that for fine tasks instructional self-talk is more effective than motivational self-talk; moreover, instructional self-talk is more effective for fine tasks compared to gross tasks. This work therefore seeks to investigate this by investigating the effectiveness of a single-subject multiple-baseline design self-talk intervention in tennis serve.

1.2 Statement of the Problem

Despite the increasing volume of research in self-talk and its relevance in sports, research on self-talk concerning non-competitive and competitive sports performance has been very sparse. For sports performance in non-competitive setting, the works of Mallett and Hanrahan (1997) tested the effectiveness of a self-talk intervention in young elite sprinters for 100m sprint race using a single-subject multiple-baseline design; and for simulated marathon competition Weinberg, Miller, and Horn (2012) organized two cross-country running events with collegiate athletes, Both showed that a self-talk intervention based on the use of recorded instructions improved performance from pre- to post-intervention over a week. Also, for competitive sport performance in real competition, Sch¨uler and Langens (2007) tested the use of self-talk strategies as a means for buffering against the negative effects of psychological crisis that occur during a marathon race in non-professional runners. They reported that among runners who experienced a large psychological crisis, those using self-talk coped better than those in a control group. The demands placed on athletes in training and competitions are different both physically and psychologically. Competitive settings are different from training on a number of features, such as the environment, the behaviour of the coach, teammates and opponents, the presence of spectators, the importance attached to the occasion, and subsequent cognitive and affective responses.

Studies and observation over time has shown that most tennis players find the serve technique most challenging. This has hampered the performance of most seasoned players including professionals. As one of those techniques in tennis requiring

precision and accuracy rather than strength and endurance, there is a need to improve this technique through self-talk intervention. Being the less practiced skill in the game and having identified the tennis serve as a weakness of most players, this study shall be geared towards improving this skill through the use of self-talk.

1.3 Aim and Objectives of the Research

This study is therefore aimed at investigating the effectiveness of a single-subject multiple-baseline design self-talk Intervention in tennis serve

The study aimed to achieve the following objectives:

- Guide individual players through the use of instructional and motivational self-talk cues, as well as their personal self-talk cues.
- Identify the impact of self-talk intervention on the serve target of individual players by comparing their performance with the control.

1.4 Scope of the research

Participants for this study shall be five Greek National tennis players drawn from different divisions of tennis team. These participants shall have an age range of 11-18 years, each of whom will be given a consent form to sign that they accept to take part in the intervention before the beginning of data collection. The effectiveness of self-talk intervention on the competitive performance of these participants shall be studied over a 5-6 week period.

1.5 Research Hypotheses

Based on the research framework, the following hypotheses were formulated.

Ho_1: There is no significant difference in the performance of players who use self-talk during tennis practice from those who don't.

Ho_2: There is no significant difference in the impact of different self-talk types and how they affect the players who use them.

1.6 Impact of the Research

This research which investigates the effectiveness of self-talk intervention on tennis serve, would enable decisions to be made by both the players and coaches alike on whether this act should be incorporated in their games (competition and training) or not and how this would aid their tennis serving skills. The awareness of self-talk and the ability to tune into it could facilitate adherence strategies to it especially as regards tennis serve. This research will also serve as a development basis in this area.

CHAPTER TWO

LITERATURE REVIEW

2.1 Self-talk definitions

Jacquin, Gualberto, and Santiago (2014) defined self-talk as the capacity to control thoughts that arise during training sessions and competitions. It is what people say to themselves either silently or aloud, inherently or strategically to stimulate and reinforce, direct and evaluate events and actions (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014). Hardy (2006) stated that self-talk is multidimensional in nature, having interpretive elements association with the content of statements employed, as being somewhat dynamic; and serving at least two functions; instructional and motivational, for the athlete. They are applied to things that are happening to provide direction and drive, or to express cognition and affect the things that will happen in an anticipative manner (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014). Studies have shown that controlling the thoughts during an activity as a result of elevated performance is quite difficult owing to the fact of the speed of entry and exit of these thoughts. Self-talk can however help the athlete to achieve cognitive control (Zinsser, Bunker, and Williams, 2001). Dosil (2008) reported it as one of the most used strategies among sports psychologists. Empirical evidence exits suggesting that the use of positive messages during an activity increases their performance level while the use of the negative messages hinders their performance (Van Raalte, Brewer, Rivera, and Petitpas, 1994).

The mind is the ultimate tool and self-talk one of its most powerful assets.

2.2 Types of Self-talk

- Inherent or automatic self-talk refers to those thoughts that individuals experience intrinsically. They are those things said to oneself which are neither planned nor prepared.
- Strategic self-talk refers to the instrumental use of cues or phrases that are planned or used in a systematic way as a mental self-regulatory strategy (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014).

With regard to its form of expression, self-talk can be described as internal or external.

- Internal or silent Self-talk refers to that Self-talk an individual has within his/her head.
- External or vocalized or out-loud Self-talk refers to Self-talk that is audible.

With regard to content, Self-talk can be characterized as positive, negative or neutral depending on the wordings used.

Furthermore, depending on the content, Self-talk can be described as instructional or motivational.

- Instructional self-talk are cues aiming to provide direction for action (eg ‘smooth’ or ‘attack her backhand’).
- Motivational self-talk are cues aiming to increase drive or confidence (eg ‘I can do that’, ‘come on now’)

Considering the content in combination with the generation of self-talk, it could be argued that inherent self-talk is mostly positive or negative; whereas strategic self-talk is mostly instructional or motivational (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014). Furthermore, when Self-talk has the desirable effect by enhancing performance, they are seen as facilitating while on the other hand, when having the detrimental effects and hurting performance, they are known as debilitating (Hardy, 2006).

2.3 Factors Affecting Self-Talk

It is noteworthy to state that the outcome of the use of self-talk is relative to the individual who employs it and as such could be affected by a wide variety of factors which are stated as follows (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014):

2.3.1 Individual Attributes: The personal motivation for an individual to succeed in a particular task can to a large extent determine the efficacy of self-talk this individual applies in that task. Hence, athletes aiming to improve their own skills and using self-referenced criteria tend to talk to themselves more positively compared to those aiming at outperforming others and using comparative criteria. Moreover, athletes with higher ego orientation are more vulnerable to impulses to disengage from a sport activity when they perceive they cannot avoid defeat.

2.3.2 Circumstantial Factors: While cognitive anxiety positively relates to negative self-talk, especially worries during competition, circumstances have been found to directly relate to self-talk. Athletes perceiving their anxiety levels as debilitative, reporting more negative self-talk than athletes perceiving their anxiety levels as facilitating (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014).

Regarding the progress of performance, it has been found in runners that identifying discrepancies between the goals athletes sought and actual performance generated negative self-talk. In other words, when things go wrong, or when athletes understand that they are not in a position to attain the goal they have set, they tend to experience negative self-talk. Game circumstances are also related to athletes' self-talk. Negative self-talk has been found to follow lost points of fault serving in tennis; nonetheless, in certain instances positive, instructional and motivational, self-talk has been observed after losing points to provide encouragement (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014)

2.3.3 Social Factors: The 'human' environment surrounding the sporting experience plays a vital role a critical role in shaping athletes' self-talk. Coaches play a vital role in athletes and their performance. The coach is the individual responsible for creating

the climate in which sport takes place. Thus, the behaviors adopted by the coach and the way information is communicated can have a significant influence on athletes' self-talk (Zourbanos, Hatzigeorgiadis, Tsiakaras, Chroni, & Theodorakis, 2010). Supportive coaching behavior (i.e. coaches being comprehensive and providing athletes' choices and options) is positively related to positive self-talk and negatively related to negative self-talk; and in contrast, negative behaviours characterized by tension and nerves are related to athletes' negative self-talk. Moreover, the way the coach behaves, the motivational climate that is promoted through the coach's practices is also important. A learning motivational climate, a climate focusing on mastering skills and personal improvement is linked to athletes experiencing more positive and less negative self-talk. In contrast, a climate that focuses on outperforming others and highlights a win-at-all-costs attitude has been linked to negative self-talk. Finally, there is also evidence that manners, body language and actual vocalized self-talk of opponents may have an effect on self-talk; usually fostering negative self-talk.

2.4 Effectiveness of Self-Talk

Various studies have provided evidences on the effectiveness of self-talk in improving sports performance. Hatzigeorgiadis, Zourbanos, Galanis, and Theodorakis (2011) reported the effectiveness of self-talk in facilitating learning as well as enhancing performance in sport tasks. They further reported as follows:

a. Self-talk to be more effective for tasks requiring fine skills such as precision and accuracy rather than tasks requiring gross skills, such as strength and endurance.
b. Self-talk to be more effective in novel rather than in well-learned skills.
c. Interventions including training for self-talk to be more effective than intervention where no training was implemented.

It is noteworthy to state that the relationship between competitive sport and self-talk and performance is reciprocal. In other words, how athletes perform influences what they say to themselves, and in turn what athletes say to themselves may influence their performance. When training and probably even more when competing, the quality of

performance and the progress athletes make towards attaining their goals determines to a large extent their self-talk. When performing well, athletes are more likely to have more positive (e.g., self-affirmative; ‘nice [shot]’, ‘let’s go’) talk and less negative (e.g., self-deprecatory; ‘you’re stupid’, ‘not good enough’) self-talk; on the other hand also when performing poorly, athletes are more likely to have more negative (e.g., self-blame; ‘another mistake’, ‘can’t take it anymore’) self-talk and less positive (e.g., self-praising; ‘doing well’, ‘keep going’) Self-talk.

Furthermore, talking positively to oneself may increase confidence and provide appropriate focus, which can result in improved performance; whereas when having negative self-talk athletes may feel disheartened and helpless, and subsequently reduce efforts or abandon the pursuit of goals. Still, these relationships are not straightforward. Athletes doing well may be distracted and have interfering, not task-related thoughts such as celebrations and follow-up interviews; and in contrast, athletes not doing well may use task relevant self-statements in an attempt to improve their concentration and maximize their efforts to reach their goal. For these reasons evidence from field co-relational studies have provided, in certain instances, inconsistent results regarding the relationships between athletes’ self-talk and performance (Hatzigeorgiadis & Biddle, 2001; Van Raalte, Brewer, Rivera, and Petitpas, 1994). Similarly, talking positively to oneself may introduce overconfidence or displace attention, thus having detrimental performance effects, and having negative self-statements may have motivating or rebooting effects thus facilitating performance. From the foregoing therefore, the effectiveness of self-talk on athletes performance is such that self-talk and performance are related. However this relationship may be regulated by other personal and situational factors.

2.5 Self-Talk Strategies

According to Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, (2014), the links between cognition and behavior, or thought and action, led sport psychologists to the development of self-regulation strategies. In other words, practitioners aimed to develop strategies to regulate athletes’ self-talk in order to improve performance. Self-

talk strategies involve the use of cue words or small phrases with the aim of enhancing performance through the activation of appropriate responses. The rationale behind the use of self-talk strategies is that athletes provide appropriate instructions or directions for action to themselves and subsequently execute the correct or appropriate action by simply following the self-instruction they have used. Interventions involving the use of self-talk strategies have dominated the sport psychology literature because, obviously, performance enhancement is the ultimate goal for athletes and coaches. Various studies on self-talk strategies with different characteristics include that of Landin and Herbert (1999) on female tennis players; Mallet and Hanrahan (1997) who studied the use of self-talk strategies among 100m sprinters, while Theodorakis, Weinberg, Natsis, Douma, & Kazakas, (2000) studied its use in motor racing. In terms of samples, self-talk interventions have been tested in school and university students, young and adult, beginner and experienced athletes. In terms of tasks, a variety of fine (e.g., dart throwing) and gross (e.g., cycling), basic motor (e.g., sit-ups) and sport specific (e.g., golf-putting) tasks have been employed. With regard to the type of self-talk, various cues have been used mostly in the form of technical instruction (e.g. 'steady head') and motivational (e.g., 'you can do it') self-talk. Finally, with regard to the characteristics of the intervention, studies have been carried out using from cross sectional to short (three to five sessions) and more extensive (eight to 12 weeks) training interventions. Overall, contrary to the inconsistent field correlational evidence, the results of experimental intervention studies have supported the effectiveness of appropriate self-talk on performance, and thus the value of self-talk strategies.

A meta-analysis of studies on the effectiveness of self-talk interventions in enhancing performance (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2011) has provided more robust evidence for the value of self-talk strategies. Overall, it was found that self-talk interventions have a moderate effect on sport task performance (effect size = .48). Furthermore, a number of factors which regulate the effectiveness of self-talk were identified. It was reported that the effectiveness of self-talk varied depending on factors pertaining to the characteristics of the task, the type of self-talk

used, and the intervention that was implemented. In particular, it was revealed that self-talk was more effective in these instances:

(a) when participants practiced self-talk over some sessions, rather than just using it without practicing it;

(b) for relatively fine tasks, such as precision and accuracy tasks (e.g., passing and shooting accuracy or tennis forehand), compared to relatively gross tasks such as power and endurance tasks (e.g., cycling or jumping performance); for novel tasks and tasks in the learning stage compared to well learned tasks.

2.6 Functions of Self-Talk

Having considered the effectiveness of self-talk, it is thereby necessary to explore some of its functions on sports performance. This will enable the development of the most appropriate strategies in-line with individual needs. Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, (2014) reports that research on the mechanisms that explain the effects of self-talk on performance is new, relatively restricted, and mostly based on athletes' reports and perceptions. Such reports emphasize the attentional and motivating function of self-talk. Athletes who have participated in self-talk interventions have reported that the use of Self-talk cues helped them to improve concentration and focus attention, increase confidence, and regulate mood; furthermore, it seems that the attentional function of self-talk is the most pertinent, at least in the early task-learning stages. Experimental evidence has provided support for some of the hypothesized mechanisms identified by the Functions of Self-Talk Questionnaire. In particular, it has been shown that instructional and motivational self-talk reduce interfering thoughts, that instructional focus can shift the focus of attention and change thought content, and that motivational self-talk increases self-efficacy and confidence, and reduces cognitive anxiety (Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009; Latinjak, Torregrosa, & Renom, 2011; Wadey & Hanton, 2008).

2.7 Application and Development of Self-Talk

2.7.1 Application of Self-Talk: As earlier stated, the basic goals of self-talk strategies are to facilitate learning and enhance performance. Facilitating learning involves

acquiring new skills, correcting mistakes, and improving technique. Enhancing performance may involve being in a state of readiness, choosing and applying effective tactics, regulating cognition and emotion, handling stressful situations or coping with adverse and unexpected events. Furthermore, self-talk can also help to develop psychological skills and enable athletes to perform according to their potential. To achieve these goals therefore, self-talk can be applied as follows:

- As an instructional strategy to improve concentration, focusing and directing attention and to give feedback;
- as a motivational strategy to increase effort, persistence, and commitment;
- and as a self-regulatory strategy to increase self-belief, self-esteem and self-control.

How to Apply Self-Talk

Different self-talk cues may be more or less suitable for different purposes; the effectiveness of self-talk is based on the activation of appropriate functions. The activation of the different functions does not happen independently from one another. Several functions operate simultaneously to produce the desired results. Nonetheless, some functions are more critical for the specific goal we aim for, and these should be targeted through the use of self-talk. Instructional self-talk is more suitable for attentional purposes such as focusing attention, improving concentration, and directing attention; whereas motivational self-talk is more suitable for purposes such as increasing confidence, improving readiness, and regulating drive. In addition, a number of parameters can be considered for deciding the appropriate self-talk cues to use: task characteristics, learning stage and experience, and the setting/circumstances are factors that should be considered in relation to the functions the different self-talk cues may serve; what has been termed as the matching hypothesis.

Matching Task Motor Demands to Self-Talk Type

Instructional and motivational cues may serve different functions. Instructional cues can be more effective in helping athletes to improve concentration, direct attention, and focus on technical aspects of a movement. Motivational cues can be more

effective in psyching-up, increasing drive, and maximizing physical effort. Considering that for fine tasks attention can be a more crucial factor for performance, whereas for gross tasks, drive and physical effort can be more crucial, instructional Self-talk should work better for fine tasks and motivational self-talk should work better for gross tasks.

Matching Learning Stage with Self-Talk Type

At the early stages of learning, the use of explicit cues in the form of instructional self-talk can improve concentration, and help them identify and shift attention to the task-relevant stimuli, thus facilitating the learning process. At more advanced performance stages athletes may benefit more from motivational cue words that refer to psychological and physical activation, the building of confidence and increasing readiness for performance. Thus, instructional self-talk should be more effective for novel tasks, or tasks at the early stages of learning, whereas motivational self-talk should be more effective for well-learned tasks, or tasks at the automatic stage of performance. Accordingly, matching athletes' experience with self-talk type, beginner athletes are more likely to benefit more from instructional cues, whereas more experienced and highly skilled athletes should benefit more from motivational cues. Expert performance can even be harmed by the use of self-talk, in particular instructional, causing the ironic effect. When a skill is well learned and performed automatically with little effort and without conscious monitoring, instructional self-talk would provide explicit rules that can be detrimental for performance causing what has been termed paralysis by analysis.

Matching the Setting to type of Self-Talk

Finally, matching the setting to type of self-talk, motivational self-talk seems more appropriate for the competitive circumstances, whereas instructional self-talk should be mostly used in training. As instructional self-talk can be more effective for learning, correcting mistakes, or improving aspects of performance, it seems more appropriate for the practice phase; in contrast, as motivational self-talk can be more

effective for increasing readiness and psyching-up, it seems more appropriate for the performance phase (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014).

When not to Apply Self-Talk

Care should be taken in order to make reasonable use of self-talk so as to avoid its overuse. This is because it is possible that talking through and overanalysing an action, disrupts and subsequently harms performance. This could be especially true for instructional self-talk, since instructional cue words often are very similar to explicit rules, which can be detrimental for the performance settings. In particular, the use of instructional self-talk could be potentially harmful when used for a well mastered skill, at the automated stages of performance, in high levels athletes, or in a competitive setting because it may interrupt the flow of performance.

2.7.2 Self-Talk Plan Development: Developing self-talk intervention is one which requires proper understanding of some fundamental steps. Key among this is a need for the athlete to identify what they want to achieve in a given situation and organize their action towards the goal. For example for a tennis player, need to improve:
(a). Reaction time for serve, (b). Return of service, and (c). What direction to hit the ball as the game goes on.

Once the athletes' needs are identified, and the specific purposes have been targeted, the matching principles should be considered to select the best possible type of self-talk (e.g., a readiness cue for 'a', an instructional cue for 'b', and a motivational cue for 'c'). Then, a list of cue words that could be tested has to be developed.

With regard to the cue words, they have to be brief – either one word or a short phrase – and logically associated to both the task and the central idea of the desired goal (e.g., for 'a', / arrow /; for 'b', focus /; 'c'/stay cool/; 'd'/bend your knees/; 'e'/arrow/; 'f'/follow through/; 'h'/hitting the serve wide: slice/; 'm'/serve middle: flat serve/; 't'/Tee-serve: spin serve/. These cues should also be extensively practiced. Not only is self-talk more effective when trained previously, athletes also perceive the technique as less difficult and more effective after repeated applications.

Once the athletes have practiced with the list of cue words they should be able to identify those self-talk cues that are most effective for the goal they want to achieve. The cues should then be organized for the development of complete self-talk plans, possibly comprising several combinations of cues to match different situations ('time' for the serve, and return of service as well as direction of ball hit all through the game). Finally, those plans should be applied and practiced until the application of self-talk is perfected (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014).

2.8 Review of Previous Works

Harwood (2009) studied how to enhance the self- efficacy of a professional tennis player. This was done with proper background understanding of the pressure players face when entering a competition. Needs assessment of the player was observed and conceptualized, this was followed by interventions administered by a psychologist using alphabet motivator, mastery imagery, on-court self-regulation training, pre-play serving practice, conditioned practice tests, mastery videos, persuasive social support, and Monitoring via accomplishment debriefing. Results showed that the physical strength, within match self- regulation skills, positive' shot selection/decision-making (when leading, under pressure); as well as wide first and second service executions were all improved as a result of this intervention.

Marshall, Hanrahan and Comoutos (2016) examined the effects of a Self-Talk (ST) intervention on golfers and anxiety and the subsequent influence on putting performances. This was done with 7 amateur golfers with a history of anxiety when putting were divided into 3 groups (control, motivational ST, and instructional ST) and completed a 10-session ST intervention involving simulated putting. Ratings of anxiety as measured by the CSAI-2R (Cox, Martens, & Russell, 2003) were obtained pre- and post-intervention. Results showed statistical significance between the three groups with improvements in the putting performance of the instructional ST group, followed by the motivational ST group, then the control group. There were, however, no significant changes in anxiety scores.

Also, Zourbanos (2013) studied the Use of Instructional and Motivational Self-Talk in Setting up a Physical Education Lesson. The effectiveness of these types of self-talk to both physical education instructors and students based on the nature of the task and the students' needs were highlighted. However, it stated that the right balance of quantity and quality of self-talk may be the key to better self-regulation, appropriate focus, and improved performance. Hence the need for physical educators to be careful in making reasonable and appropriate use of it, as overusing self-talk may cause 'paralysis by analysis'. It also stated that if self-talk is implemented correctly and consistently, the rewards will be enhanced performance and positive experiences during the PE lesson, which may influence students to maintain a physically active lifestyle into adulthood.

In the same vein, Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis (2014) studied the effect of a 10-week self-talk intervention on competitive performance in young swimmers on 41 swimmers whose performance was recorded on 2 competitive occasions with a 10-week interval. In-between the 2 competitions, participants in the intervention group followed a self-talk training program. The results showed that the intervention group had greater performance improvements than the control group, thus, supporting the effectiveness of the program in enhancing sport performance in a competitive environment.

This study therefore studies the effect of self-talk intervention in tennis serve performance of tennis players.

CHAPTER THREE

3.1 Participants

Six players were initially sampled for this work, i.e. experimental (n = 5 players) and control (n = 1 player). However, one of the players was dropped from the experimental group. The work comprised of 5 amateur tennis players having a minimum of 5 and maximum of 7 years playing experience (M= 6.2, SD = 1.06) who were carefully selected. All participants were drawn from junior and senior Greek private and public schools that practice at tennis icon academy. These participants had an age range of 12-17 years (M = 14.4, SD = 1.95), and were each given a consent form to sign that they accept to take part in the intervention before the beginning of data collection. These players were randomly assigned as experimental (n = 4 players) and control (n = 1 player). All players were made to perform their tasks at different times and days usually in 2-sessions- morning and afternoon. The practice sessions were scheduled in such a way as not to affect their personal schedule as well as their involvement in other championship competitions within and outside the country for which they might wish to be involved in. Also, with considerations for the availability of tennis court and hours of training, care was taken to ensure that each training session for the competitive team comprised of maximum of eight 8 players and a minimum of four 4 players so as to avoid overcrowding.

3.2 Procedures and Intervention

3.2.1 Procedure

The procedure was approved by Internal Ethics Committee of the Department of PE and Sport Science, University of Thessaly. Players and their individual coaches were contacted and the players, asked to participate in the program. These Coaches were briefed with regard to the purposes of the study and subsequently gave their consent. Participants were then informed about the purpose of the program as well as about consent of their individual coaches. They were also told that participation was voluntary and that they could withdraw without any consequences anytime they wished. After which they were each given a consent form to sign that they accept to take part in the intervention before the beginning of data collection.

3.2.2 Intervention

Experimental Group

Prior to the intervention, participants were given a short presentation on self-talk and how the intervention was going to work. The need for the participants to attend all the training sessions according to their schedule was emphasised.

At the beginning of each practice session, the players were informed of the purpose and the content of the session, the daily plan was also communicated accordingly. The need for and how to use the necessary self-talk plan for the day were also highlighted. All through these practice sessions, players were made to understand, learn and master the use of self-talk, as well as being able to effectively develop their own self-talk cues.

Control Participant

The Participant in this group was informed that his performance during the practice session would be recorded to evaluate the progress made. Emphasis was made on why it is important for him to attend all the practice sessions according to his schedule. At the end of the data collection, this participant was debriefed and offered to attend the intervention program if he so wished.

Baseline Intervention

A target was set where the players were made to aim at without any form of instruction/correction, In other words with no self-talk cues. This routine was done 3-times a week.

Also, this routine was performed with some form of self-talk cues which the players had to say before they serve. These self-talk cues are ‘Ball’, ‘Wide’, ‘Middle’ or ‘Tee’. Others are ‘Toss’, ‘Knees’ or ‘Arrow’. These were considered instructional self-talk cues. Other athletes were made to practice serve for 2-weeks without any form of self-talk. Self-talk was introduced to them after the 3rd week following the same format (i.e. Instructional self-talk for 2- weeks followed by motivational self-talk, then a combination of both). They were subsequently encouraged to develop their

own self-talk cues (i.e. what they will like to say to themselves in practice session during the last week of the intervention). Using Table 3.1, the performance of the players over the intervention period was tabulated.

Table 3.1: Players' serve performance over the intervention period (Intervention and control group

	WEEK 1				WEEK 2				WEEK 3				WEEK 4				WEEK 5			
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20
Player			*Instructional Self-Talk*						*Motivational Self-talk*				*Instructional + Motivational Self-Talk*				*Personal Self-Talk*			
A																				
B																				
									Instructional Self-Talk			*Motivational Self-Talk*			*Instructional + Motivational Self-Talk*		*Personal Self-Talk*			
C																				
D																				
CONTROL SAMPLE																				
E*																				

3.3 Measures

3.3.1 Performance

The ability of the players to successfully aim the set target pre and post-intervention was used to evaluate their performance.

3.3.2 Scoring System

There were 6 targets in total- 3 at the right side of the court and 3 at the left side of the court. A box was drawn at the area of the 3 targets and 2 cones were placed in each box. There were 2 sets of 5 balls to each target, giving a total of 10 balls in each target; hence a total of 30 balls to the right service box and another 30 to the left service box. Total number of balls = 60.

Scoring was done in such a way that each time the participants hit the ball into the box whether it hits the cone or not, he/she scores 5 points. But if the ball doesn't fall into the box (the target), he/she scores 0 (zero). Each player was made to serve 10 balls to each box where the cone was placed. Hence scores were done in this format: *wide*:

2/10, *middle*: 1/10, *Tee*: 4/10 etc. The scoring system was properly explained to the players as a vital aspect of the practice session. Two observers recorded the performance of each participant's balls, 10 serves on each target (wide with a slice serve, middle with a flat serve, and tee with topspin). As shown in the diagram

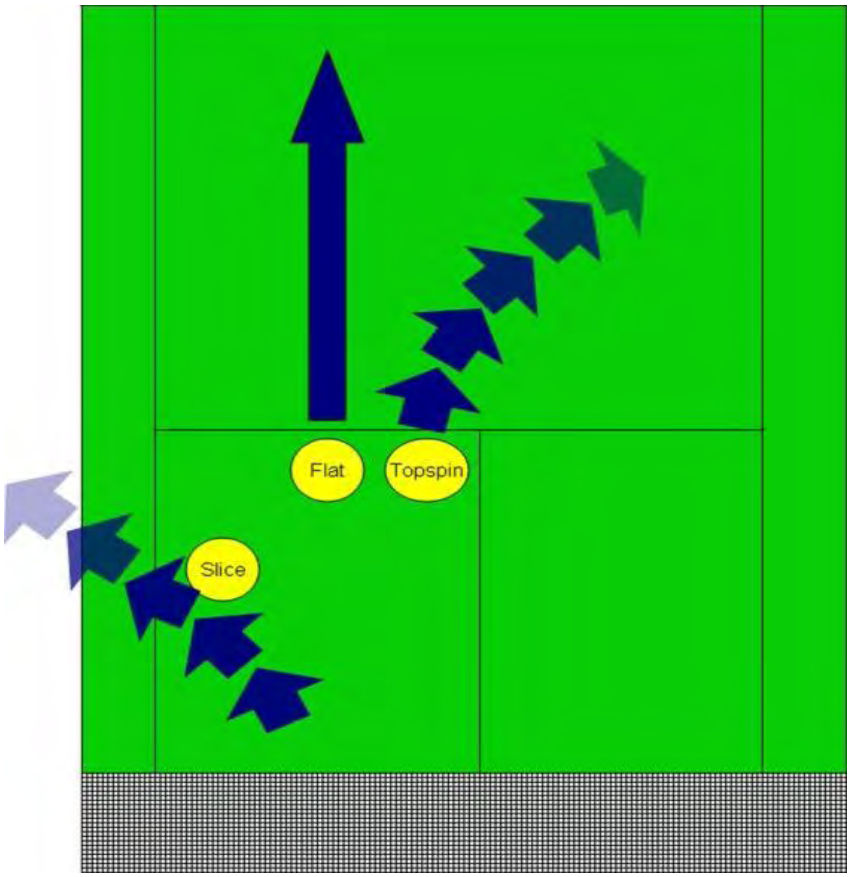

Figure 3.1: Schematic diagram of the ball target scheme for the players

3.3.3 Follow-Up

All participants were interviewed by the researcher at the tennis academy, individually and away from the other players, using Semi-structured interviews. The players were asked to complete a questionnaire with open ended questions (See Appendix). Interviews lasted for ten minutes or less. The research focused on a pilot study. The intervention lasted for five weeks.

3.3.4 Analysis

The results of the descriptive statistics of each participant are shown in graphs and tables below.

CHAPTER FOUR
RESULTS

4.1 Use of Self-talk

Self-talk

Generally, the mean score for the use of self-talk in the tennis serve practice session was 8.15 (*SD* = 0.93), suggesting that all the players made adequate use of the self-talk cues. Most importantly, this result also shows that these players adhered to the use of these self-talk cues to a large extent. Two of the participants in the intervention group (Player C and D) were observed to apply self-talk days before the intervention started. Player C consistently applied motivational self-talk within the first 2-weeks, while Player D was observed to have applied self-talk in the first week (Days 1, 2 and 7). The self-talk type employed by this participant on Day 2 was motivational in nature.

The player in the control group reported saying some specific things to himself (Self-talk) almost every time he was about to serve which were motivational in nature. However, because this self-talk was unorganized and utilized in a non-systematic way, they were considered negligible for the purpose of this study.

4.2 Self- Talk Interventions

From the results obtained from the players' performance, Figures 4.1 to 4.5 were obtained. For players in the intervention group, the spaces in the plot of their scores per day indicate the performance of these players before and while in intervention (when they started to apply self-talk in their game).

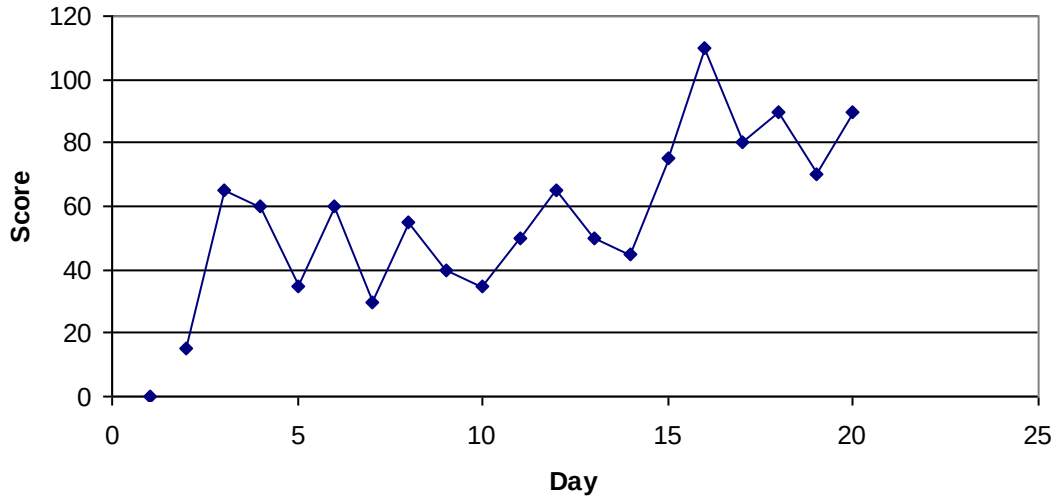

Figure 4.1: Graph Showing the Baseline Intervention for Player A

With a mean score of 56, Player A had the least performance in terms of hitting the set target as compared to other players in the experimental group. The best performance of this player came with the use of a combination of Motivational and instructional Self-talk. The use of personal self-talk also improved this player's performance considerably. It was observed that this player chose personal self-talk which were instructional in nature rather than motivational example: "Ball", "Toss", "Jump", "follow the serve", name of the angle (such as "wide", "tee", and "middle")

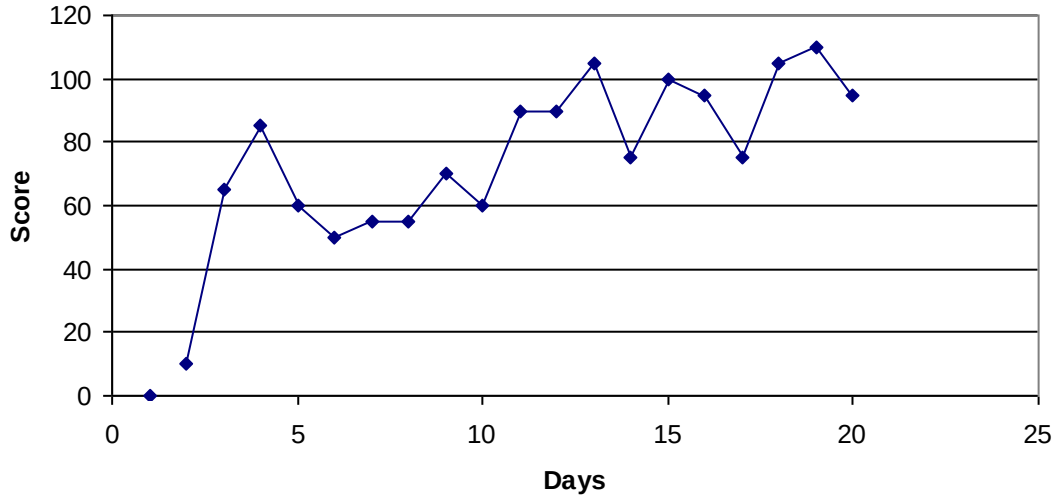

Figure 4.2: Graph Showing the Baseline Intervention for Player B

This player (B) had the second best performance of all (M=72.5). Performance of this player showed the effectiveness of personal Self-talk as the highest score in hitting the set target came with the use of this, which also gave consistently high scores. Also, his use of a combination of instructional and motivational Self-talk as directed by the researcher also gave good scores, thereby enhancing his serve ability.

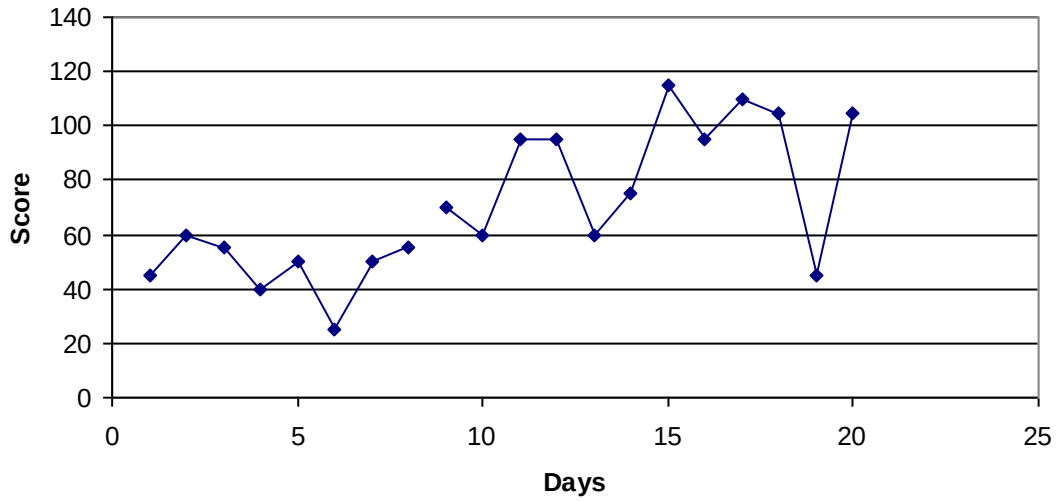

Figure 4.3: Graph Showing the Baseline Intervention for Player C

Prior to the guide and directive of the researcher, Player C was seen to have consistently applied motivational self-talk on himself in order to aid his serve ability (M=70.5). The maximum score of 115 was obtained on day 15 when a combination of instructional and motivational self-talk was applied by this player. The use of personal self-talk which was developed by the player also gave considerably high scores.

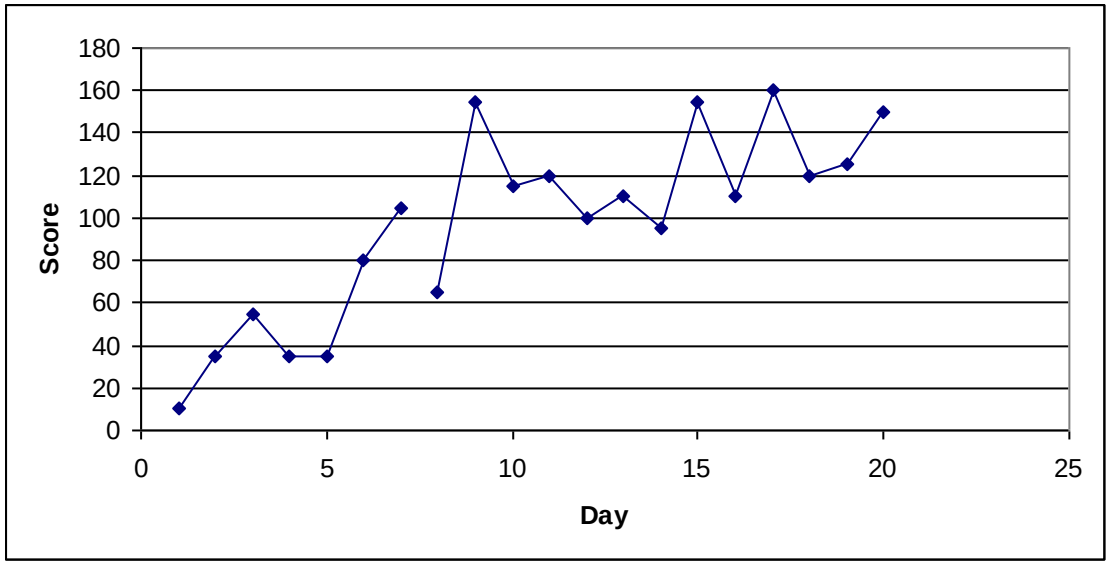

Figure 4.4: Graph Showing the Baseline Intervention for Player D

The effectiveness of Self-Talk in enhancing the serve ability of Tennis player was very evident with the performance of Player D. With M = 96.75, this player had the most accuracy and precision in hitting the set targets and this is attributable to the fact that this player used Self-talk at almost every stage of the practice session (starting from Days 1, 2 and 7) even before being instructed to do so. The highest scores were observed between days 15 – 17 when this player was applied a combination of instructional & motivational self-talk. Furthermore, it was observed that applying the personal self-talk of the player between (days 18-20) as well as instructional self-talk (day 9 -11) gave relatively high scores for hitting the target and thus underscores the effectiveness of self-talk in enhancing the serve ability of players.

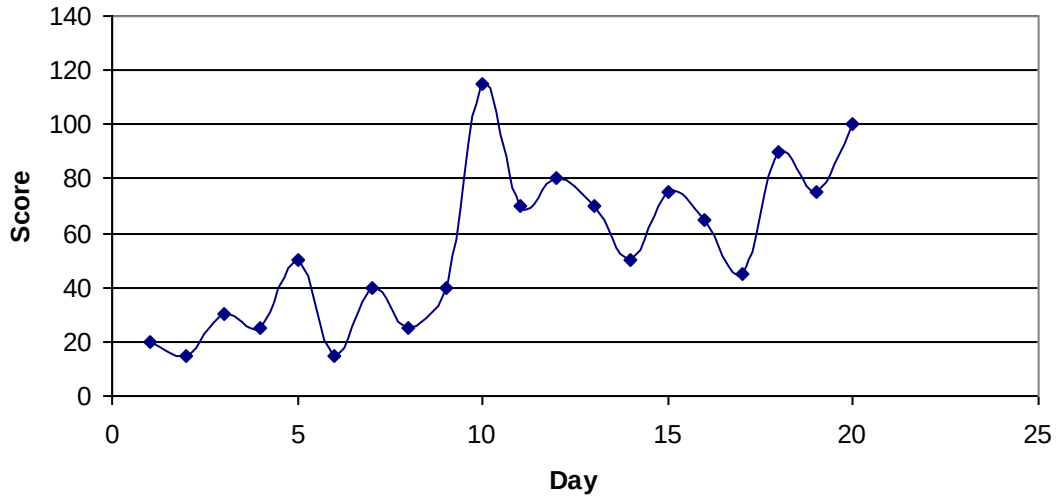

Figure 4.5: Graph Showing the Performance Score for Player E*(Control)

Having had no form of intervention, the control player (Player E*) had the least scores (M=54.76) for the practice test. The high scores on days 10 and 20 (115 and 100 respectively) might be attributed to some form of self-talk which this player admitted to have used in the course of the practice session though in a non-systematic or pre-planned way as had been reported by Hatzigeorgiadis, Galanis, Zourbanos &Theodorakis (2014). It must however be stated that it is normal for people talk to themselves, especially athletes in achievement contexts; however it is the systematic use and maybe the knowledge of purpose that produce the desirable effects. Hence the form of self-talk being employed by Player E* did not form part of this study.

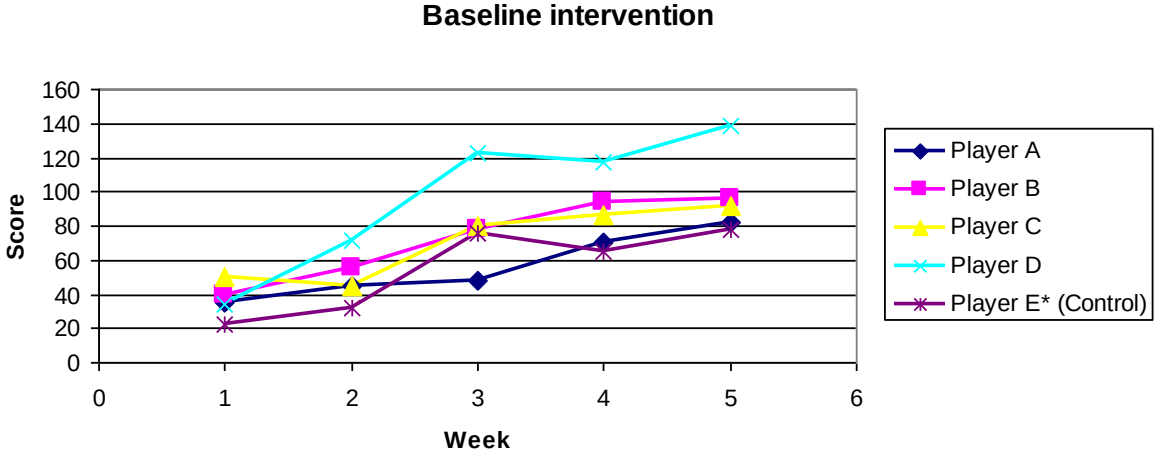

Figure 4.6: Summary average weekly performance of all the Players over the Intervention Period

Comparatively, the score of the all the players in the intervention group were relatively higher than that of the player on the control group as shown in Figure 4.6 above. Thus the results of this study have confirmed the previous findings regarding the effectiveness of self-talk on sport performance in non-competitive (practice) setting.

CHAPTER FIVE
DISCUSSION AND CONCLUSION

5.1 Self-Talk Discussion

Having studied and proven the effectiveness of self-talk intervention in competitive situations, over the years, there has been a need to study its effectiveness in practice/training session in order to clearly ascertain the difference between spontaneous (non-systematic) and systematic self-talk. Being the strongest moderator of the effectiveness of every competition (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2011), it is training that makes performance at competitive level effective. Hence the need to seek a design of self-talk intervention during practice or training session, as addressed in this work. Self-talk cues were not given to the players on the first day in order to allow them master the scoring system as well as to avoid promoting the use of self-talk among these players especially the control player as recommended by Hardy, Hall, Gibbs and Greenslade (2005). More importantly too, to maintain a level playing ground, it was ensured that none of the players had previously received a psychological skills training intervention prior to their involvement in the process

Use of Self-Talk

Mean use of self-talk by players in the intervention group [M = 8.15 (*SD* = 0.93)] suggested that these players made adequate use of the self-talk cues as required of them and this formed an integral part of their game as well as the eventual outcome. The cues were given to these players when they were required to apply them in the training. They were also given a chance to develop and use their own self-talk cues and this equally formed part of the study. It was also observed that some of the players unconsciously used self-talk even before it was required of them.

Judging from the results of the performance, one interesting contribution of this study is the observation from most of the players in the intervention group having preference for the various self-talk typesin this order: *Instructional + Motivational*

self-talk>Personal self-talk>Motivational self-talk>Instructional self-talk. Hatzigeorgiadis, Zourbanos, Latinjak, &Theodorakis, (2014) had earlier reported the effectiveness of instructional self-talk types in helping athletes improve their concentration, direct attention and also create focus on technical aspects of movement in any sports; as well as that of motivational self-talk in psyching-up, increasing drive and maximizing physical efforts of athletes.

Furthermore, because learning requires concentration, the combined instructional and motivational self-talk cues might have helped these players identify and shift attention to the task-relevant stimuli, while also psyching them up thus facilitating their learning process during the practice session. Also, instructional self-talk has been identified to be effective for novel tasks; while motivational self-talks are very effective for tasks at automatic performance stage (Hatzigeorgiadis, Zourbanos, Latinjak, &Theodorakis, 2014). It therefore implies that the combination of these self-talk types would have helped these players to adequately adapt to the serve techniques required of them from these sessions; especially as it involved a transition from learning these serve skills (and the scoring system) to the mastery of same.

Hence it can be deduced that the preference for the players involved in this study for a combination of instructional and motivational self-talk cues resulted from the nature of the sports. Besides being a sport with lots of technical movements, tennis also requires maximum concentration, direct attention, precision and accuracy. In addition, players having similar experience range (5-7 years), experience might have played a role in their choice of self-talk type. This is in accordance with the work of Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, (2014) which reported that beginner and highly experienced athletes are more likely to benefit from instructional and motivational self-talk types respectively. Moreover, paralysis by analysis might have been responsible for the observed relative poor performance of these players when they used only the Instructional self-talk type.

Effectiveness of Self-Talk

From this study, it was observed that all the players in the intervention group [Players A, B, C and D] performed better than the player in the control group. This work also sought a link between the player performance and their use of self-talk.

Hence, the results above show a direct relationship between these players use of Self-talk and the precision with which they hit the set target when they served. Hatzigeorgiadis, Zourbanos, Galanis, and Theodorakis (2011) had earlier reported Self-talk to be more effective for tasks requiring fine skills such as precision and accuracy rather than tasks requiring gross skills, such as strength and endurance. Since the effectiveness of the use of self-talk in this work was determined by the precision and accuracy with which these players hit their set targets, it is therefore in agreement with the earlier submission. Tennis coaches and sports psychologists should therefore note the following on how to apply self-talk during practice and competition sessions:

Coaches need to take note of what their players say to themselves either negatively or positively and also seek an approach that is suitable for each athlete as players defer from the other. Also, since self-talk could be positive or negative and having also found the detrimental effect of negative self-talk, it is important for coaches and sports psychologists alike to make concerted effort to discourage the use of negative self-talk among their players.

However, it is also advised that the decision to either encourage or discourage the use of self-talk among players should be done with a careful consideration of their individual needs. This is because while negative self-talk could have detrimental effect in the performance of some players, it enhances that of others- for example, cases exist of players who only perform well when they get angry and say negative things to themselves.

In the same vein, more work should be done by tennis coaches and sports psychologists alike in order to identify their individual needs, so as to know which self-talk cue types to suggest to these players; and how they can go about their use.

It is also recommended that coaches equip themselves with the mental aspect of the game. Hence attending update and refresher courses regularly is strongly advised.

This would help acquaint them with the latest trend especially as regards sending the right information across to these players as well as the right use and application of self-talk cues among these players. Tennis being a sport that requires lots of mental skills such as: technical movements, concentration, direction of attention, precision, accuracy etc, self-talk helps players to maintain these components. And this is what differentiates professional from the armature.

Future research direction

Based on the observations from this study, three important future directions can be derived from the current research: First, Use of self-talk in other areas of tennis game such as serve-return, ball placement, maintaining focus during the game etc is recommended. This would help to determine the effects of self-talk cues in this area. It will also further determine the impact of self-talk and that of inherent skills of the players. Secondly, more research should be done on the use of self-talk in tennis under competitive conditions. Since competitiveness brings out the best in players, these results will further strengthen the findings from this study. Finally, comparative study of effect of the use self-talk in practice session as well as competitive situations is recommended.

5.2 Conclusion

In conclusion, the use of self-talk in the experimental group suggests that all the players in the intervention group made adequate use of their self-talk cues. The use of these cues resulted in improved scores of the players in the intervention group as compared to the one in the control group. Combination of motivational and instructional self-talk gave the best result among these players. Preference for this self-talk type has been attributed to the sport type- being one which requires technical movements, concentration, direct attention, precision and accuracy. Number of years of experience is another factor that could have also influenced this choice. Above all, these players admitted/attested to the use of self-talk greatly improving key aspects of their game such as: concentration level on what they do, their mental strength, helped them maintain focus, as well as psyche themselves up all through the practice session. They also reported an improvement in their target execution ability. A direct

relationship between the players' use of Self-talk and the precision with which they hit the set target when they served was also observed. Therefore, this work has shown that the use of a single-subject multiple-baseline design self-talk intervention is effective in tennis serve.

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APPENDIX

DATA COLLECTION

1. **Calculate will be 5+10+5+20 =40**

EXPERIMENTAL 1: PLAYER A

1ST WEEK: DAY 1

	FIRST ATTEMPT		SECOND ATTEMPT	
9/5/2017	Right	Left	Right	Left
Wide	0	0	0	0
Middle	0	0	0	0
Tee	0	0	0	0
TOTAL SCORE				**0**

1ST WEEK: DAY 2

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	0
Middle	1	0	0	1
Tee	0	1	0	0
TOTAL SCORE	**15**			

OBSERVATION DAY2: When hits the cone he says “Agoris Ney Rey” which means YES.

1ST WEEK: DAY 3 (Use of **INSTRUCTIONAL SELF-TALK START HERE**)

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	1	2
Middle	1	2	1	2
Tee	0	1	1	1
TOTAL SCORE	**65**			

1ST WEEK: DAY 4

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	1	2	0
Middle	2	0	1	1
Tee	1	2	0	1
TOTAL SCORE	**60**			

EXPERIMENTAL 1: (Continuation of **INSTRUCTIONAL SELF-TALK**)

2ND WEEK: DAY 5

	FIRST ATTEMPT		SECOND ATTEMPT	
18/5/2017	Right	Left	Right	Left
Wide	1	1	0	0
Middle	1	0	0	2
Tee	0	0	1	1
TOTAL SCORE	**35**			

2ND WEEK: DAY 6

	FIRST ATTEMPT		SECOND ATTEMPT	
19/5/2017	Right	Left	Right	Left
Wide	2	2	2	2
Middle	1	1	0	0
Tee	1	0	1	0
TOTAL SCORE	**60**			

OBSERVATION DAY 6: When he misses the target today he said “kedromalaka”

2ND WEEK: DAY 7

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	0	0
Middle	0	0	2	2
Tee	0	0	1	0
TOTAL SCORE	**30**			

2ND WEEK: DAY 8

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	1	1	1
Middle	0	3	2	0
Tee	1	0	0	1
TOTAL SCORE	**55**			

EXPERIMENTAL 1: (MOTIVATIONAL SELF-TALK)

3RD WEEK: DAY 9

	FIRST ATTEMPT		SECOND ATTEMPT	
8/6/2017	Right	Left	Right	Left
Wide	2	2	1	0
Middle	1	2	1	1
Tee	1	0	1	0
TOTAL SCORE	**40**			

3RD WEEK: DAY 10

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	1	0
Middle	1	1	1	1
Tee	0	0	0	0
TOTAL SCORE	**35**			

3RD WEEK: DAY 11

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	2	1
Middle	1	1	1	1
Tee	2	0	0	0
TOTAL SCORE	**50**			

3RD WEEK: DAY 12

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	1	1	1
Middle	0	0	2	0
Tee	1	1	1	1
TOTAL SCORE	**65**			

EXPERIMENTAL 1: (Combination of **INSTRUCTIONAL ANDMOTIVATIONAL SELF-TALK**)

4TH WEEK: DAY 13

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	3	0
Middle	1	0	1	2
Tee	0	0	0	2
TOTAL SCORE	**50**			

4TH WEEK: DAY 14

	FIRST ATTEMPT		SECOND ATTEMPT	
18/6/2017	Right	Left	Right	Left
Wide	0	1	0	0
Middle	3	2	0	1
Tee	1	0	1	0
TOTAL SCORE	**45**			

4THWEEK: DAY 15

	FIRST ATTEMPT		SECOND ATTEMPT	
19/6/2017	Right	Left	Right	Left
Wide	1	1	3	1
Middle	0	2	2	0
Tee	0	1	2	2
TOTAL SCORE	**75**			

4TH WEEK: DAY 16

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	2	2	1
Middle	2	1	1	3
Tee	3	2	2	1
TOTAL SCORE	**110**			

EXPERIMENTAL 1: (**PERSONAL SELF-TALK**). Cues he choose were "Ball, Toss, Power, Jump, follow the serve, name of the angle like wide, tee, and middle.

5TH WEEK: DAY 17

	FIRST ATTEMPT		SECOND ATTEMPT	
6/7/2017	Right	Left	Right	Left
Wide	1	0	1	2
Middle	1	2	3	2
Tee	1	1	1	1
TOTAL SCORE	**80**			

5TH WEEK: DAY 18

	FIRST ATTEMPT		SECOND ATTEMPT	
7/7/2017	Right	Left	Right	Left
Wide	0	3	3	1
Middle	1	2	2	3
Tee	1	1	0	1
TOTAL SCORE	**90**			

5TH WEEK: DAY 19

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	1	1	1
Middle	1	2	2	2
Tee	1	1	1	0
TOTAL SCORE	**70**			

5TH WEEK: DAY 20

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	3	1	1
Middle	2	0	1	2
Tee	1	2	2	1
TOTAL SCORE	**90**			

EXPERIMENTAL 2: PLAYER B

1ST WEEK: DAY 1

	FIRST ATTEMPT		SECOND ATTEMPT	
9/5/2017	Right	Left	Right	Left
Wide	0	0	0	0
Middle	0	0	0	0
Tee	0	0	0	0
TOTAL SCORE	**0**			

1ST WEEK: DAY 2

	FIRST ATTEMPT		SECOND ATTEMPT	
9/5/2017	Right	Left	Right	Left
Wide	0	1	0	0
Middle	1	0	0	0
Tee	0	0	0	0
TOTAL SCORE	**10**			

1ST WEEK: DAY 3 (USE OF **INSTRUCTIONAL SELF-TALK ON DAY 3**)

	FIRST ATTEMPT		SECOND ATTEMPT	
14/5/2017	Right	Left	Right	Left
Wide	0	1	2	1
Middle	0	1	1	2
Tee	1	4	2	2
TOTAL SCORE	**65**			

1ST WEEK: DAY 4

	FIRST ATTEMPT		SECOND ATTEMPT	
15/5/2017	Right	Left	Right	Left
Wide	1	0	1	1
Middle	1	1	1	2
Tee	1	5	1	2
TOTAL SCORE	**85**			

OBSERVATION DAY4: When he hits the target today he said “YES YESYES” out aloud.

2ND WEEK: DAY 5 (Continuation of **INSTRUCTIONAL SELF-TALK**)

	FIRST ATTEMPT		SECOND ATTEMPT	
19/5/2017 (Morning)	Right	Left	Right	Left
Wide	0	1	0	2
Middle	2	1	1	1
Tee	1	1	1	1
TOTAL SCORE	**60**			

2ND WEEK: DAY 6

FIRST ATTEMPT	SECOND ATTEMPT

19/5/2017 (Afternoon)	Right	Left	Right	Left
Wide	0	2	1	2
Middle	2	1	1	0
Tee	0	0	0	1
TOTAL SCORE	**50**			

2ND WEEK: DAY 7

	FIRST ATTEMPT		SECOND ATTEMPT	
20/5/2017	Right	Left	Right	Left
Wide	1	0	2	1
Middle	0	1	1	2
Tee	2	1	1	1
TOTAL SCORE	**55**			

2ND WEEK: DAY 8

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	2	0	1
Middle	0	2	0	2
Tee	3	2	0	1
TOTAL SCORE	**55**			

3RD WEEK: DAY 9 (**MOTIVATIONAL SELF-TALK**)

	FIRST ATTEMPT		SECOND ATTEMPT	
22/5/2017	Right	Left	Right	Left
Wide	2	1	1	2
Middle	0	2	0	1
Tee	1	1	1	2
TOTAL SCORE	**70**			

3RD WEEK: DAY 10

	FIRST ATTEMPT		SECOND ATTEMPT	
24/5/2017	Right	Left	Right	Left
Wide	1	1	1	2
Middle	0	1	1	1
Tee	2	0	0	2
TOTAL SCORE	**60**			

3RD WEEK: DAY 11

FIRST ATTEMPT	SECOND ATTEMPT

25/5/2017	Right	Left	Right	Left
Wide	2	1	1	1
Middle	2	3	1	2
Tee	2	2	0	1
TOTAL SCORE				**90**

3RD WEEK: DAY 12

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	2	3	0
Middle	1	0	2	3
Tee	2	2	0	3
TOTAL SCORE				**90**

4TH WEEK: DAY 13 (Combination of **INSTRUCTIONAL AND MOTIVATIONAL SELF-TALK**)

	FIRST ATTEMPT		SECOND ATTEMPT	
30/5/2017	Right	Left	Right	Left
Wide	2	2	2	2
Middle	1	1	1	2
Tee	2	1	3	2
TOTAL SCORE	**105**			

4TH WEEK: DAY 14

	FIRST ATTEMPT		SECOND ATTEMPT	
31/5/2017	Right	Left	Right	Left
Wide	1	2	1	1
Middle	2	1	2	1
Tee	1	1	2	0
TOTAL SCORE	**75**			

4TH WEEK: DAY 15

	FIRST ATTEMPT		SECOND ATTEMPT	
2/6/2017	Right	Left	Right	Left
Wide	0	1	3	2
Middle	1	2	1	2
Tee	0	0	2	3
TOTAL SCORE	**100**			

4TH WEEK: DAY 16

FIRST ATTEMPT	SECOND ATTEMPT

	Right	Left	Right	Left
Wide	1	2	1	1
Middle	0	2	1	1
Tee	3	0	3	2
TOTAL SCORE	**95**			

5TH WEEK: DAY 17 (**PERSONAL SELF-TALK**). Cue "

	FIRST ATTEMPT		SECOND ATTEMPT	
6/6/2017	Right	Left	Right	Left
Wide	0	1	2	1
Middle	1	0	1	2
Tee	1	3	2	1
TOTAL SCORE	**75**			

5TH WEEK: DAY 18

	FIRST ATTEMPT		SECOND ATTEMPT	
7/6/2017	Right	Left	Right	Left
Wide	2	0	0	3
Middle	2	0	2	2
Tee	1	2	4	2
TOTAL SCORE	**105**			

5TH WEEK: DAY 19

	FIRST ATTEMPT		SECOND ATTEMPT	
26/6/2017	Right	Left	Right	Left
Wide	2	2	2	2
Middle	1	2	1	3
Tee	2	2	2	1
TOTAL SCORE	**110**			

5TH WEEK: DAY 20

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	2	4	1
Middle	0	2	2	2
Tee	1	3	1	1
TOTAL SCORE	**95**			

EXPERIMENTAL 3: PLAYER C

1ST WEEK: DAY 1

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	1	1
Middle	0	2	1	0
Tee	0	1	2	1
TOTAL SCORE	**45**			

1ST WEEK: DAY 2

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	0	2
Middle	1	1	3	2
Tee	1	1	0	0
TOTAL SCORE	**60**			

1ST WEEK: DAY 3

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	1	1
Middle	1	1	0	1
Tee	1	3	0	2
TOTAL SCORE	**55**			

1ST WEEK: DAY 4

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	2
Middle	1	0	1	0
Tee	1	0	1	2
TOTAL SCORE	**40**			

2ND WEEK: DAY 5

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	2	1
Middle	1	1	1	0
Tee	0	0	0	4
TOTAL SCORE	**50**			

2ND WEEK: DAY 6

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	1	0
Middle	0	0	0	1
Tee	0	0	2	0
TOTAL SCORE	**25**			

2ND WEEK: DAY 7

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	2	1
Middle	0	1	1	1
Tee	1	0	1	1
TOTAL SCORE	**50**			

2ND WEEK: DAY 8

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	2	1	1
Middle	0	0	1	2
Tee	2	2	0	0
TOTAL SCORE	**55**			

OBSERVATION for the 2 weeks: When he misses the target today he said "Oh no, next he says now I am going to hit it" all this were said out loud and other things in Greek which I do not understand.

3RD WEEK: DAY 9 (USE OF **INSTRUCTIONAL SELF-TALK START**)

	FIRST ATTEMPT		SECOND ATTEMPT	
28/6/2017	Right	Left	Right	Left
Wide	0	0	2	3
Middle	2	0	2	2
Tee	0	1	2	0
TOTAL SCORE	**70**			

3RD WEEK: DAY 10

	FIRST ATTEMPT		SECOND ATTEMPT	
3/6/2017	Right	Left	Right	Left
Wide	1	1	2	1
Middle	0	0	2	0
Tee	1	0	4	0
TOTAL SCORE	**60**			

OBSERVATION: He complained about the wind today. And later he says out loud that I will hit all the balls at the TEE.

3RD WEEK: DAY 11

	FIRST ATTEMPT		SECOND ATTEMPT	
7/6/2017	Right	Left	Right	Left
Wide	2	2	2	1
Middle	2	1	1	1
Tee	1	3	2	1
TOTAL SCORE	**95**			

3RD WEEK: DAY 12

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	1	3	2
Middle	1	0	1	3
Tee	2	1	2	2
TOTAL SCORE	**95**			

4TH WEEK: DAY 13 (USE OF **MOTIVATIONAL SELF-TALK**)

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	2	0	0
Middle	1	1	2	1
Tee	0	0	3	2
TOTAL SCORE	**60**			

4TH WEEK: DAY 14

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	1	1	1
Middle	0	0	3	1
Tee	2	2	1	2
TOTAL SCORE	**75**			

4TH WEEK: DAY 15 (COMBINATION OF **INSTRUCTIONAL AND MOTIVATIONAL SELF-TALK)**

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	3	2	0
Middle	1	2	1	2
Tee	2	2	3	3
TOTAL SCORE	**115**			

4TH WEEK: DAY 16

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	3	3	2	1
Middle	1	1	1	1
Tee	2	2	1	1
TOTAL SCORE	**95**			

5TH WEEK: DAY 17 (CONTINUATION OF **INSTRUCTIONAL AND MOTIVATIONAL SELF-TALK)**

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	3	2	3
Middle	2	2	2	2
Tee	2	0	2	0
TOTAL SCORE	**110**			

OBSERVATION: Ela, the hitting the racket on the ground, elarey malaka, fuck he says.

4TH WEEK: DAY 18 (**PERSONALSELF-TALK). Cues were "take an ace, ball, court, jump.**

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	1	1	2
Middle	2	0	2	3
Tee	2	2	2	2
TOTAL SCORE	**105**			

5TH WEEK: DAY 19

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	1	3
Middle	0	1	0	0
Tee	0	0	1	3
TOTAL SCORE	**45**			

5TH WEEK: DAY 20

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	1	3	1
Middle	1	3	2	1
Tee	3	2	0	2
TOTAL SCORE	**105**			

EXPERIMENTAL 4: PLAYER D

1ST WEEK: DAY 1

	FIRST ATTEMPT		SECOND ATTEMPT	
13/5/2017	Right	Left	Right	Left
Wide	0	0	0	1
Middle	1	0	0	0
Tee	0	0	0	0
TOTAL SCORE	**10**			

OBSERVATION: Ela, changing her racket. Also a kind of self-talk was observed.

1ST WEEK: DAY 2

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	0
Middle	0	0	0	1
Tee	0	1	2	3
TOTAL SCORE	**35**			

OBSERVATION: debirazi meaning do not worry. Then she complains of the net being too high.

1ST WEEK: DAY 3

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	1	1	0
Middle	0	2	2	0
Tee	2	2	0	0
TOTAL SCORE	**55**			

1ST WEEK: DAY 4

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	0
Middle	1	1	1	0
Tee	1	0	1	2
TOTAL SCORE	**35**			

2ND WEEK: DAY 5

	FIRST ATTEMPT		SECOND ATTEMPT	
3/6/2017	Right	Left	Right	Left
Wide	0	1	0	0
Middle	1	0	1	1
Tee	0	0	0	3
TOTAL SCORE	**35**			

2ND WEEK: DAY 6

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	1	1
Middle	2	2	0	2
Tee	2	2	2	1
TOTAL SCORE	**80**			

2ND WEEK: DAY 7

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	3	2
Middle	4	3	1	2
Tee	2	2	0	2
TOTAL SCORE	**105**			

OBSERVATION: She was always saying something to herself though I could hear her and sometime not. But always after each ball.

2ND WEEK: DAY 8

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	0
Middle	2	1	2	1
Tee	3	1	2	1
TOTAL SCORE	**65**			

3RD WEEK: DAY 9 (Use of **INSTRUCTIONAL SELF-TALK Began in the third week.**)

	FIRST ATTEMPT		SECOND ATTEMPT	
10/5/2017	Right	Left	Right	Left
Wide	2	3	1	1
Middle	3	2	4	3
Tee	0	1	2	2
TOTAL SCORE	**155**			

3RD WEEK: DAY 10

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	2	1	1
Middle	2	3	3	2
Tee	4	2	1	2
TOTAL SCORE	**115**			

2ND WEEK: DAY 11

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	1	1	2
Middle	2	2	3	2
Tee	2	2	4	2
TOTAL SCORE	**120**			

3RD WEEK: DAY 12 (**MOTIVATIONAL SELF-TALK**)

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	3	2	0
Middle	2	1	2	4
Tee	1	0	1	4
TOTAL SCORE	**100**			

4TH WEEK: DAY 13 (Continuation of **MOTIVATIONAL SELF-TALK)**

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	3	2	3
Middle	2	1	2	2
Tee	1	2	2	0
TOTAL SCORE	**110**			

4TH WEEK: DAY 14

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	1	3	2
Middle	3	2	1	2
Tee	1	0	1	1
TOTAL SCORE	**95**			

4TH WEEK: DAY 15 (Combination of **INSTRUCTIONAL AND MOTIVATIONAL SELF-TALK**)

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	2	3	4
Middle	3	4	3	3
Tee	2	1	2	2
TOTAL SCORE	**155**			

4TH WEEK: DAY 16

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	3	3	2
Middle	2	4	2	0
Tee	0	1	3	1
TOTAL SCORE	**110**			

4TH WEEK: DAY 17

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	2	3	4
Middle	3	3	2	3
Tee	4	3	2	2
TOTAL SCORE	**160**			

4TH WEEK: DAY 18(**PERSONAL SELF-TALK**). Cues were "Grip, target, calm, focus, come on.

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	3	1	1
Middle	2	3	2	1
Tee	3	3	2	1
TOTAL SCORE	**120**			

4TH WEEK: DAY 19

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	3	4	2
Middle	1	2	2	2
Tee	2	1	3	3
TOTAL SCORE	**125**			

4TH WEEK: DAY 20

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	4	3	1	3
Middle	2	4	2	2
Tee	3	2	2	2
TOTAL SCORE	**150**			

CONTROL INDIVIDUAL: No any form of self-talk was introduced to him = PLAYER E*

1ST WEEK: DAY 1

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	1
Middle	1	1	0	0
Tee	0	0	1	0
TOTAL SCORE	**20**			

OBSERVATION: At the very first stage he was already shouting at himself. Eg; ela hit the cone.

1ST WEEK: DAY 2

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	0
Middle	2	0	0	1
Tee	0	0	0	0
TOTAL SCORE	**15**			

1ST WEEK: DAY 3

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	1	1
Middle	1	1	0	0
Tee	0	0	1	0
TOTAL SCORE	**30**			

1ST WEEK: DAY 4

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	1	2
Middle	2	0	0	0
Tee	0	0	0	0
TOTAL SCORE	**25**			

2ND WEEK: DAY 5

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	2	0
Middle	1	1	1	1
Tee	0	0	1	2
TOTAL SCORE	**50**			

2ND WEEK: DAY 6

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	0
Middle	0	1	2	0
Tee	0	0	0	0
TOTAL SCORE	**15**			

2ND WEEK: DAY 7

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	2	0
Middle	0	0	3	0
Tee	1	0	0	1
TOTAL SCORE	**40**			

2ND WEEK: DAY 8

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	0	0	0
Middle	2	1	0	1
Tee	1	0	0	0
TOTAL SCORE	**25**			

3RD WEEK: DAY 9

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	1	0
Middle	2	1	0	1
Tee	1	0	1	0
TOTAL SCORE	**40**			

3RD WEEK: DAY 10

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	2	3	2
Middle	1	0	2	3
Tee	1	2	1	4
TOTAL SCORE	**115**			

3RD WEEK: DAY 11

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	1	2	3
Middle	1	0	3	1
Tee	0	1	0	0
TOTAL SCORE	**70**			

3RD WEEK: DAY 12

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	2	2	1
Middle	2	1	2	1
Tee	1	1	1	1
TOTAL SCORE				**80**

4TH WEEK: DAY 13

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	2	0	0
Middle	1	1	2	1
Tee	1	2	1	2
TOTAL SCORE	**70**			

4TH WEEK: DAY 14

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	1	0	1	1
Middle	1	0	1	1
Tee	1	1	1	1
TOTAL SCORE	**50**			

4TH WEEK: DAY 15

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	1	1	1
Middle	0	1	2	1
Tee	1	1	3	1
TOTAL SCORE	**75**			

4TH WEEK: DAY 16

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	1	2
Middle	1	0	1	3
Tee	0	1	2	1
TOTAL SCORE	**65**			

5TH WEEK: DAY 17

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	0	1	0	1
Middle	1	1	0	2
Tee	0	0	2	1
TOTAL SCORE	**45**			

5TH WEEK: DAY 18

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	1	2	1
Middle	1	2	1	0
Tee	2	1	2	3
TOTAL SCORE	**90**			

5TH WEEK: DAY 19

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	1	2	1
Middle	0	2	0	3
Tee	1	1	1	1
TOTAL SCORE	**75**			

5TH WEEK: DAY 20

	FIRST ATTEMPT		SECOND ATTEMPT	
	Right	Left	Right	Left
Wide	2	1	2	3
Middle	0	1	2	2
Tee	1	2	2	2
TOTAL SCORE	**100**			